

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A cache-coherent input/output device comprising:
 - a plurality of client ports, each to be coupled to one of a plurality of port components;
 - a plurality of sub-unit caches, each coupled to one of said plurality of client ports and assigned to one of said plurality of port components; and
 - a coherency engine coupled to said plurality of sub-unit ~~eaches; caches.~~
~~wherein the plurality of client ports, the plurality of sub-unit caches and the coherency engine are integrated onto a single cache coherent device.~~
2. (Original) The device of claim 1 wherein said plurality of port components include processor port components.
3. (Original) The device of claim 1 wherein said plurality of port components include input/output components.
4. (Original) The device of claim 3 wherein said plurality of sub-unit caches include transaction buffers using a coherency logic protocol.
5. (Original) The device of claim 4 wherein said coherency logic protocol includes a Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.

6. (Currently Amended) A processing system comprising:
- a processor;
- a plurality of port components; and
- ~~-an integrated- a cache-coherent input/output device coupled to said processor and~~
- including a plurality of client ports, each coupled to one of said plurality of port components, said cache-coherent device further including a plurality of caches, each coupled to one of said plurality of client ports and assigned to one of said plurality of port components, and a coherency engine coupled to said plurality of caches.
7. (Original) The processing system of claim 6 wherein said plurality of port components include processor port components.
8. (Original) The processing system of claim 6 wherein said plurality of port components include input/output components.
9. (Currently Amended) In a cache-coherent input/output device including a coherency engine and a plurality of client ports, a method for processing a transaction, comprising:
- receiving a transaction request at one of a plurality of client ports on ~~an integrated-the~~
- ~~input/output cache-coherent device-with a coherency engine~~, said transaction request includes an address; and
- determining whether said address is present in one of a plurality of sub-unit caches, each of said sub-unit caches assigned to said one of ~~a-said~~ plurality of client ports.

10. (Original) The method of claim 9 wherein said transaction request is a read transaction request.

11. (Original) The method of claim 10 further comprising:
transmitting data for said read transaction request from said one of said plurality of sub-unit caches to one of said plurality of client ports.

12. (Original) The method of claim 11 further comprising:
prefetching one or more cache lines ahead of said read transaction request; and
updating the coherency state information in said plurality of sub-unit caches.

13. (Original) The method of claim 12 wherein the coherency state information includes a Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.

14. (Original) The method of claim 9 wherein said transaction request is a write transaction request.

15. (Original) The method of claim 14 further comprising:
modifying coherency state information for a cache line in said one of said plurality of sub-unit caches;
updating coherency state information in others of said plurality of sub-unit caches by said coherency engine; and

transmitting data for said write transaction request from said one of said plurality of sub-unit caches to memory.

16. (Original) The method of claim 15 further comprising:
 - modifying coherency state information of said write transaction request in the order received; and
 - pipelining multiple write requests.

17. (Original) The method of claim 16 wherein the coherency state information includes a Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.